

Claims

1. Lower leg protective apparel, in particular protective socks, against chemical and/or biological noxiants composed of a plurality of plies, comprising an outside leg part (1) and, disposed in the interior of the outside leg part (1), a laminate (2) which comprises a flexible, windproof and water-rejecting membrane (7) which forms the outer surface of the laminate (2) and which forms at least a barrier to biological noxiants, a carbon layer (8) which is disposed underneath the membrane (7) and which comprises carbon in fibrous or particulate form, and an inner textile ply (9) which is characterized in that the outside leg part (1) is fabricated from a plurality of cuts (4, 5, 6) and in that the seams of the laminate (2) disposed in the interior of the outer leg part (1) are sealed off by a waterproof material.
2. The lower leg protective apparel according to claim 1 which is characterized in that the membrane (7), at least to some extent, additionally forms a barrier against liquid chemical noxiants.
3. The lower leg protective apparel according to claim 1 which is characterized in that an inside leg part (3) is disposed as a further ply, underneath the laminate (2) composed of membrane (7), carbon layer (8) and textile ply (9).
4. The lower leg protective apparel according to claim 1, 2 or 3 which is characterized in that the plurality of plies (1, 2, 3) are bonded together.
5. The lower leg protective apparel according to claim 4 which is characterized in that the plurality of plies (1, 2, 3) are sewn together.
6. The lower leg protective apparel according to claim 5 which is characterized in that the plurality of plies (1, 2, 3) are sewn together at their upper ends and in the foot tip region.
7. The lower leg protective apparel according to claim 1 which is characterized in that the membrane (7) is breathable.
8. The lower leg protective apparel according to claim 1 which is characterized in that the membrane (7) comprises polyester and/or polyether or a mixture thereof.

9. The lower leg protective apparel according to claim 1 which is characterized in that the membrane (7) is microporous.
10. The lower leg protective apparel according to claim 9 which is characterized in that the membrane (7) comprises polytetrafluoroethylene, in particular expanded polytetrafluoroethylene.
11. The lower leg protective apparel according to claim 10 which is characterized in that the pores have such a size or some of the pores are closed such that on the one hand the permeation of biological and/or chemical noxiants is resisted and on the other there is water vapor perviousness.
12. The lower leg protective apparel according to claim 1 which is characterized in that the carbon layer (8) comprises a fabric of woven or loop-drawingly knit material.
13. The lower leg protective apparel according to claim 12 which is characterized in that the active surface area of carbon layer (8) is in a range from 1000 to 1200 m²/g.
14. The lower leg protective apparel according to claim 1 which is characterized in that the thickness of carbon layer (8) is in a range from 0.2 to 1.0 mm.
15. The lower leg protective apparel according to claim 1 which is characterized in that the carbon layer (8) is impregnated.
16. The lower leg protective apparel according to claim 15 which is characterized in that the impregnation comprises silver, copper, chromium, polytetrafluoroethylene or mixtures thereof.
17. The lower leg protective apparel according to claim 1 which is characterized in that the membrane (7) is based on cellophane.
18. The lower leg protective apparel according to claim 1 which is characterized in that the membrane (7) comprises polyvinyl alcohols, polyacrylamides or polyurethane.
19. The lower leg protective apparel according to claim 1 which is characterized in that the carbon layer (8) is provided with active spherules of carbon.

20. The lower leg protective apparel according to claim 1 which is characterized in that the carbon layer (8) comprises a fabric of activated carbon fibers.
21. The lower leg protective apparel according to claim 20 which is characterized in that the carbon layer (8) comprises loop-drawingly knit activated carbon fibers.
22. The lower leg protective apparel according to claim 1 which is characterized in that the outside leg part (1) comprises wool, cotton, silk, polyester, polypropylene, polyamide, polyacrylic or mixtures thereof.
23. The lower leg protective apparel according to claim 1 which is characterized in that the textile ply (9) in the laminate (2) is a woven or loop-formingly knit fabric.
24. The lower leg protective apparel according to claim 3 which is characterized in that the inside leg part (3) is hydrophilic.
25. The lower leg protective apparel according to claim 3 which is characterized in that the inside leg part (3) is made of manufactured fibers.
26. The lower leg protective apparel according to claim 25 which is characterized in that the inside leg part (3) comprises polypropylene, polyamide, polyester or mixtures thereof.
27. The lower leg protective apparel according to claim 3 which is characterized in that the inside leg part (3) is longer than the other plies, the longer region being turned on the upper side over at least one of the other plies.
28. The lower leg protective apparel according to claim 3 which is characterized in that the inside leg part (3) is stitched with a soft, fleecy spun yarn to at least one of the other plies (1, 2).
29. The lower leg protective apparel according to claim 1 which is characterized in that the laminate (2) formed from the membrane (7), the carbon layer (8) and the textile ply (9) is fabricated from a plurality of cuts (4, 5, 6).
30. The lower leg protective apparel according to claim 29 which is characterized in that the cuts comprise a sole part (6), a foot upper part (5) and a shaft (4).

31. The lower leg protective apparel according to claim 3 which is characterized in that the outside leg part (1) and/or the inside leg part (3) are fabricated from a plurality of cut parts.
32. The lower leg protective apparel according to claim 29, 30 or 31 which is characterized in that the cuts (4, 5, 6) are joined together by a flatlock or zigzag stitch.
33. The lower leg protective apparel according to any one of claims 29 to 32 which is characterized in that the seams are sealed off by a waterproof material.
34. The lower leg protective apparel according to claim 3 which is characterized in that the seams are sealed off by a seam-sealing tape composed of waterproof material.
35. The lower leg protective apparel according to any one of claims 30 to 32 which is characterized in that the seams are sealed off by a waterproof adhesive.
36. The lower leg protective apparel according to claim 1 which is characterized in that the textile ply (9) is hydrophilic.